

Application No. 10/624,331
Amendment dated August 17, 2006
Reply to Office Action of April 17, 2006

REMARKS

Status Of Application

Claims 1-6 are pending in the application; the status of the claims is as follows:

Claim 5 is objected to because of informalities.

Claims 4 and 5 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Claims 1 and 4-6 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,734,118 to Marechal et al. (“Marechal et al.”) in view of U.S. Application Publication No. US-2002/0053223 to Nishikawa (“Nishikawa”).

Claims 1-6 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Japanese Publication No. 60-171231 to Shimizu et al. (“Shimizu et al.”) in view of U.S. Patent No. 3,900,328 to Parsons et al. (“Parsons et al.”) and Nishikawa.

The acknowledgement, in the Office Action, of a claim for foreign priority under 35 U.S.C. § 119(a)-(d), and that the certified copy of the priority document has been received, is noted with appreciation.

The indication, in the Office Action, that the Examiner has no objections to the drawings filed on July 22, 2003, is noted with appreciation.

Objection to the Abstract

The objection to the abstract of the invention as not being in narrative form and generally limited to a single paragraph within the range of 50 to 150 words is noted. An

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amended Abstract is presented in this Amendment. Accordingly, reconsideration and withdrawal of the objection is respectfully requested.

Claim Amendments

Claim 5 has been amended to correct matters of form. These changes do not introduce any new matter.

35 U.S.C. § 112 Rejection

The rejection of claims 4 and 5 under the second paragraph of 35 U.S.C. § 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention, is respectfully traversed based on the following:

Because the glass is dropped on to the lower mold surface in the reference surface formation step in molten form, there is no need for the mold to be at a temperature that would cause the glass to soften. The temperature of the surfaces is up to 100°C below the transition temperature of the glass. The glass is not in the softened state at this temperature. Therefore, claim 4 is correct

Claim 5 has been amended to correct the informalities cited by the Examiner.

Accordingly, it is respectfully requested that the rejection of claims 4 and 5 under the second paragraph of 35 U.S.C. § 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention, be reconsidered and withdrawn.

35 U.S.C. § 103(a) Rejections

The rejection of claims 1 and 4-6 under 35 U.S.C. § 103(a), as being unpatentable over Marechal et al. in view of Nishikawa, is respectfully traversed based on the following:

Marechal shows molds 1 or 20, and 2 or 21 for the surfaces of a lens. Molds 20 and 21 abut a ring 23. Together, these components form the mold for a glass lens. A precisely measured perform 9 or 26 is placed in the mold (col. 3, lines 56-58; col. 6, lines 32-45). The glass perform is heated to a molten state by induction heating of the mold (col. 6, lines 13-17 and 27-31).

Nishikawa shows that an optical element may be formed by dropping a micro glass molten droplet 8 onto a mold in a molten state (paragraph [0047]). There is no suggestion of any temperature parameters for this alternative step and no discussion of the nature of this mold; although two open type molds are shown in Figures 6 and 7. In the second embodiment, the flat mold 9 is heated to 400°C after the droplet was dropped onto the mold. It can only be presumed that the flat mold 9 was not heated prior to dropping the droplet 8.

In contrast to the cited references, claim 1 includes:

1. (Original) An optical element manufacturing method, comprising:
a preparation step of preparing a lower mold having a lower mold surface for forming an optical function surface of an optical element to be manufactured and an upper mold having an upper mold surface for forming another optical function surface of the optical element, said lower mold having an outer shape restricting surface for the optical element or being combined with a member having the outer shape restricting surface, said upper mold being opposed to the lower mold;

a reference surface formation step of forming a positioning reference surface on a rim of the optical element by heating the outer shape restricting surface of the lower mold or combined with the lower mold and the lower mold surface and dropping molten glass onto the lower mold surface so as to collide with the lower mold surface and spread to be in contact with the outer shape restricting surface;

...

wherein a temperature of the outer shape restricting surface in the reference surface formation step and the pressing step is higher than a temperature which is a difference when 100°C is subtracted from a glass transition temperature (°C) of the glass.

The process of Marechal requires a preform of precise mass having a geometry close to the desired final object, heating both the preform and the mold to a temperature where the glass is viscous and pressing the glass (col. 3, line 56 – col. 4, line 7). One skilled in the art would not combine a process using a preform in an enclosed mold with a process of dropping glass droplets as suggested in Nishikawa. There is no way to get the droplet into the enclosed mold. The two processes are incompatible and contrary to any suggestion to combine them. In addition, there is no suggestion of holding the mold to a temperature that may be less than the transition temperature of the glass in Marechal and no discussion of mold temperature when the droplet 8 is formed in Nishikawa. Therefore, the cited references do not show or suggest “a lower mold having a ... an upper mold ..., said lower mold having an outer shape restricting surface for the optical element ... heating the outer shape restricting surface of the lower mold ... and dropping molten glass onto the lower mold surface so as to collide with the lower mold surface and spread to be in contact with the outer shape restricting surface; ...wherein a temperature of the outer shape restricting surface in the reference surface formation step and the pressing step is higher than a temperature which is a difference when 100°C is subtracted from a glass transition temperature (°C) of the glass.” Thus, claim 1 is patentably distinct from the prior art. Claims 2-6 are dependent upon claim 1, and thus include every limitation of claim 1. Therefore, claims 2-6 are also patentably distinct from the prior art. MPEP §2143.03.

Accordingly, it is respectfully requested that the rejection of claims 1, and 4-6 under 35 U.S.C. § 103(a) as being unpatentable over Marechal et al. in view of Nishikawa, be reconsidered and withdrawn.

The rejection of claims 1-6 under 35 U.S.C. § 103(a), as being unpatentable over Shimizu et al. in view of Parsons et al. and Nishikawa, is respectfully traversed based on the following.

Shimizu shows an enclosed mold for a lens including a bottom 1, a top 2, and an outer ring comprised of two pieces 3L and 3R. The top and bottom of the mold are pressed to the desired thickness of the lens and the excess material is pressed into an annular space formed between the top mold 2 and the outer ring.

Parsons shows heating glasslike carbon mold inserts 15 and 17 to a temperature of 530°C to 590°C, softening a cane 47 of optical crown glass to a temperature of 600°C to 700°C and pressing the mold inserts against the softened glass (col. 7, lines 6-25).

In contrast to the cited references, claim 1 includes:

1. (Original) An optical element manufacturing method, comprising:
a preparation step of preparing a lower mold having a lower mold surface for forming an optical function surface of an optical element to be manufactured and an upper mold having an upper mold surface for forming another optical function surface of the optical element, said lower mold having an outer shape restricting surface for the optical element or being combined with a member having the outer shape restricting surface, said upper mold being opposed to the lower mold;

a reference surface formation step of forming a positioning reference surface on a rim of the optical element by heating the outer shape restricting surface of the lower mold or combined with the lower mold and the lower mold surface and dropping molten glass onto the lower mold surface so as to collide with the lower mold surface and spread to be in contact with the outer shape restricting surface;

...
wherein a temperature of the outer shape restricting surface in the reference surface formation step and the pressing step is higher than a temperature which is a difference when 100°C is subtracted from a glass transition temperature (°C) of the glass.

The process of Shimizo uses an enclosed mold, heating both the preform and the mold to a temperature where the glass is viscous and pressing the glass. One skilled in the art would not combine a process using an enclosed mold with the process using an open mold and softened glass at end of a cane as in Parsons. Further, the lens is removed from the mold in Parsons using the cane (col. 7, lines 27-29). This is impossible with an enclosed mold. The two processes are incompatible and contrary to any suggestion to

combine them. In addition, as noted above, one skilled in the art would not combine a process using a preform in an enclosed mold with a process of dropping glass droplets as suggested in Nishikawa. There is no way to get the droplet into the enclosed mold. These processes are also incompatible and contrary to any suggestion to combine them. In addition, there is no mention of the transition temperature of the glass in Parsons, only specified absolute temperatures. This provides no suggestion of any temperature relative to the transition temperature of the glass. There is no discussion of mold temperature at all in Nishikawa or Shimizu. Therefore, the cited references do not show or suggest “a lower mold having a ... an upper mold ..., said lower mold having an outer shape restricting surface for the optical element ... heating the outer shape restricting surface of the lower mold ... and dropping molten glass onto the lower mold surface so as to collide with the lower mold surface and spread to be in contact with the outer shape restricting surface; ...wherein a temperature of the outer shape restricting surface in the reference surface formation step and the pressing step is higher than a temperature which is a difference when 100°C is subtracted from a glass transition temperature (°C) of the glass.” Thus, claim 1 is patentably distinct from the prior art. Claims 2-6 are dependent upon claim 1, and thus include every limitation of claim 1. Therefore, claims 2-6 are also patentably distinct from the prior art.

Accordingly, it is respectfully requested that the rejection of claims 1-6 under 35 U.S.C. § 103(a) as being unpatentable over Shimizu et al. in view of Parsons et al. and Nishikawa, be reconsidered and withdrawn.

CONCLUSION

Wherefore, in view of the foregoing amendments and remarks, this application is considered to be in condition for allowance, and an early reconsideration and a Notice of Allowance are earnestly solicited.

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This Amendment does not increase the number of independent claims, does not increase the total number of claims, and does not present any multiple dependency claims. Accordingly, no fee based on the number or type of claims is currently due. However, if a fee, other than the issue fee, is due, please charge this fee to Sidley Austin LLP Deposit Account No. 18-1260.

If an extension of time is required to enable this document to be timely filed and there is no separate Petition for Extension of Time filed herewith, this document is to be construed as also constituting a Petition for Extension of Time Under 37 C.F.R. § 1.136(a) for a period of time sufficient to enable this document to be timely filed.

Any other fee required for such Petition for Extension of Time and any other fee required by this document pursuant to 37 C.F.R. §§ 1.16 and 1.17, other than the issue fee, and not submitted herewith should be charged to Sidley Austin LLP Deposit Account No. 18-1260. Any refund should be credited to the same account.

Respectfully submitted,

By: 
Douglas A. Sorensen
Registration No. 31,470
Attorney for Applicant

DAS/lb
SIDLEY AUSTIN LLP
717 N. Harwood, Suite 3400
Dallas, Texas 75201
Direct: (214) 981-3482
Main: (214) 981-3300
Facsimile: (214) 981-3400
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